

- a predetermined refraction index and/or
- a predetermined density of said coating layer.

16. ✓ The method according to claim 15, *wherein*
the thickness of the coating layer is selected to be one quarter of the given wavelength emitted by the laser.

17. ✓ The method according to claim 15, *wherein*
the process parameters of the PE-CVD process are adjusted to produce a refraction index of the coating layer of at least 1.83 for a GaAs/AlGaAs laser.

18. The method according to claim 15, *wherein*

- the coating layer is amorphous $\text{Si}_x\text{O}_y\text{N}_z\text{H}$, and
- the process parameters of the PE-CVD process are selected to result in a Si/N ratio between 0.75 and 1.5 whereby the density of said amorphous coating layer approaches the density of crystalline Si_3N_4 .

19. ✓ The method according to claim 15, *wherein*
the controlled process parameters of the PE-CVD process include:

- the gaseous components and their relative ratios forming the plasma,
- the power of said plasma,
- the pressure, and
- the substrate temperature at which said PE-CVD process is executed.

20. ✓ The method according to claim 19, *wherein*
the controlled process parameters of the PE-CVD process further include:

- the total flux of the gaseous components and
- the addition of H as precursor gas.

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cont'd
21. / A semiconductor laser designed for emitting at a given wavelength and having an emission facet with a coating layer of a predetermined reflectivity, *wherein*
- said coating layer is homogeneous and of a preselected thickness,
 - said coating layer is produced by a PE-CVD process, and
 - said coating layer's refraction index and/or density is adjusted by the process parameters of said PE-CVD process.
22. / The semiconductor laser according to claim 21, said laser having a semiconductor body in which a standing wave is produced, *whereby* coupling of said standing wave between said semiconductor body and the coating layer occurs at the minimum of said standing wave.
23. / The semiconductor laser according to claim 21, *wherein* the semiconductor laser is a GaAs/AlGaAs laser.
24. / The semiconductor laser according to claim 21, *wherein* the coating layer comprises amorphous $\text{Si}_x\text{O}_y\text{N}_z\text{H}$.
25. / The semiconductor laser according to claim 21, *wherein* the refraction index of the coating layer is at least 1.83 for a GaAs/AlGaAs laser.
26. / The semiconductor laser according to claim 21, *wherein* the thickness of the coating layer is one quarter of a given wavelength emitted by the laser.
27. The semiconductor laser according to claim 21, *wherein*
- the coating layer is amorphous $\text{Si}_x\text{O}_y\text{N}_z\text{H}$, and
 - the Si/N ratio in said coating layer is between 0.75 and 1.5.
28. / An all-optical transmitter with an optical input and an optical output and optical means between said input and said output, *wherein* said optical means comprises a semiconductor laser according to claim 21.
29. / An all-optical amplifier with an optical input and an optical output and optical amplification means between said input and said output, *wherein*
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